

doubtless, we shall have data for a better determination of these points.

The place of this star (1880) is:

R.A. $19^{\text{h}} 21^{\text{m}} 40^{\text{s}}$
Decl. $+27^{\circ} 5'$

Mount Hamilton:
1891 October 31.

Note on some apparently variable Nebulae.

By J. L. E. Dreyer, Ph.D.

In his ninth list of new nebulae found at the Warner Observatory (*Astr. Nachr.*, No. 3004), Mr. Lewis Swift gave under No. 13 the following position (for 1890) and description of a nebula:

1889 December 23 $3^{\text{h}} 36^{\text{m}} 6^{\text{s}}$ $95^{\circ} 2' 1''$ — $eeF, pL, R, 1\text{st}$ of 3 in line with 1417-18, cometary. Unable to refind it; seeing good. Failed also at Harvard College Observatory.

In No. 3014 of the same journal Mr. Swift remarks about this object: "I strongly suspect it to have been a comet, as at two subsequent examinations it could not be found. It was in line with N.G.C. 1417 and 1418, and all three were seen simultaneously."

From an examination of all the observations of nebulae in the region in question, it appears to me to be more likely that we have here to do with a variable nebula and not with a comet. The following positions are all reduced to 1860:

Sir William Herschel.

	h	m	s	$^{\circ}$	'	
III. 569	3	32	54	95	7	eeF, lE, er
II. 455	3	34	59	95	8	Two, the p one pB, cL, E, lbM ,
II. 456	3	35	26	95	9	the f one eF, vS, E .

Sir John Herschel.

- $h 305$	3	34	32.5	95	7 \pm	No descr. 1st of 3 (one observation).
- $h 306$	3	34	41.4	95	8 48	R, np $a\star$, 2nd of 3 (one obs.).
- $h 307$	3	35	1.8	95	9 36	$pB, S, B\star$ 1' sf (3 obs.).

d'Arrest.

III. 569	3	32	49.0	95	7 18	(2 obs.)
II. 455	3	35	0.5	95	9 28	(6 obs.)
II. 456	3	35	19.0	95	11 10	(3 obs.)

Dec. 1891.

apparently variable Nebulae.

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In the General Catalogue Sir John Herschel has only made use of his own observations, assuming III. 569 = h 305. That this was erroneous was pointed out by d'Arrest, whose positions of the three nebulae agreed well with those determined by Sir W. Herschel. As I had also at Birr Castle in 1875-77 four times observed these three objects (and seen no others near them), and found their relative positions to be as indicated by d'Arrest, I adopted these in the New General Catalogue.

I had, however, when preparing the observations of nebulae made with Lord Rosse's telescope for publication, been considerably puzzled at finding several observations from the years 1848-56, according to which there seemed to be a nebula nearly in the place of h 305. These observations are as follows:

1848 December 19.—3 neb. nearly in a line nnp .* Middle one the brightest, 2 others F. From 1st to 2nd about $10'$, from 2nd to 3rd about $6'$.

1850 October 7.—1st appears divided, and p part has a minute * or stellar point in it; 2nd about $11'$ off is brightest of the 3 and bM ; 3rd about $7'$ from 2nd is equable in light, and I suspect a fourth F one perhaps $20'$ off [G.C. 763].

1850 December 8.—1st is vF , and has a $S\star np$; 2nd has, I suspect, a F Nucl; it is bM , and the brightest of the 3, n of a *. About $16' f$ the third is a F Nova [G.C. 763].

1851 January 22.—1st eeF , divided ? * in p part; 2nd $9' sf$, centre r ? Brightest of them. 3rd $4' sf$ 2nd and $14' f$ is one, vF , E.

1855 December 13.—Found only h 306 and 307.

1856 December 26.— p one is vF , mottled; 2nd is pB , $Enp sf$, bMN ; the 3rd is vF , lE ? no Nucl.

But in 1872, 1875, and three times in 1877 only h 306, h 307, and G.C. 763 were seen. The last observation (1877, December 6) I took for the special purpose of seeing whether there was a nebula $8'$ or $10'$ north preceding h 306, but as I could only see III. 569, $33'$ preceding h 306, I concluded that the observers in 1848-56, who used Sir J. Herschel's Catalogue of 1833 as a working list, had been influenced by the relative positions in that Catalogue when estimating the distance between the first two nebulae.

Now, however, the matter assumes a different aspect after Mr. Swift's observation. His position of the object seen in December 1889 is for 1860—

$3^h 34^m 37^s$ $95^\circ 8' 0''$

or $6' 2$ north preceding II. 455, with which and with II. 456 it was seen in a straight line. This position agrees well with that

* nnp should, no doubt, be npp .

determined by Sir John Herschel (*h* 305), as well as with the place given by the Birr Castle observers in 1848-56. This very faint nebula would seem to have been visible in 1827, 1848, 1850, 1851, 1856, and 1889, while it was not seen in 1785, 1855, 1864, 1865, 1872, 1875, 1877, and 1890. It is, however, important to remember that it was only *specially looked for* in 1877 and 1890, though d'Arrest probably also looked specially in the place given by Sir J. Herschel for *h* 305.

Observers of nebulae are accustomed occasionally to find a particular object very difficult to see owing to atmospheric causes, but the present case is certainly a very suspicious one, and the region 6' north preceding the nebula II. 455=N.G.C. 1417 should therefore be watched from time to time with powerful instruments. II. 455 and 456 are easily recognised, as they form a trapezium with two stars of 11th or 12th magnitude south following.

Some years ago Professor Winnecke drew attention to two nebulae which he suspected of periodic variability, *h* 229 and *h* 882.* The former was invisible (or perhaps barely visible) to Schönfeld in December 1861 (6½-inch refractor), and invisible to Vogel on two nights in November 1865 (8½-inch refractor), while all other observers (including Schönfeld in 1864) called it *pB*, or of the second class. In November 1887 I noted it as "fully of the second class," and in December 1888 as "perhaps barely of the second class." The evidence of variability does not seem very strong in this case. As regards *h* 882, the variability seems scarcely better established. Great weight cannot be attached to the circumstance that Boguslawski (using a 3½-inch refractor) inserted it as bright on the Berlin map (*Hora XI.*), as he very possibly merely did so because it had been rated as a first-class nebula by W. Herschel. On May 24, 1887, I looked it up, but "could only just see it, and should certainly not have found it but for the star 6th mag. *nf*; twilight and strong haze." This observation is, however, of very little value, but on March 30, 1891, I found it "*pB*, though perhaps barely of the second class," and on April 8, 1891, "*pB*, good to observe" [with bright wire illumination]. This agrees with J. Herschel's, d'Arrest's, and Winnecke's estimates, and the suspicion of variability rests almost entirely on the fact that J. Herschel, in 1830, found it "eF, 2nd or 3rd class." It should be remembered that this is a diffused nebula with very slight central condensation, and, as far as my experience goes, the appearance of objects of this kind is far more influenced by the state of our atmosphere than that of nebulae with a distinct condensation generally is.

In the notes to the General Catalogue (p. 32), Sir J. Herschel suggests that a change may have occurred in the nebula I 41=*h* 1452. "On April 5,† 1784, H. describes it as L, B, *r*,

* *Monthly Notices*, xxxviii. p. 104, *Astron. Nachr.*, No. 2293.

† Should be April 25 according to Caroline Herschel's copy of the sweeps in the Society's library.

sbM,* *iR* figure, Class I.; on March 3,[†] 1789, *pB*, *cL*, *i* Fig., *er*, many of the stars visible, so that it may be called a cluster." J. Herschel and d'Arrest estimated it as belonging to the third class. I observed it twice in May 1891, and found it "F, *pL*, diffused, perhaps double or with *vF* star involved south, very little or no condensation, irregular figure, barely second class." This is another case of an uncondensed nebula, and there does not seem any reason to think it variable. I may mention that the right ascension (according to *h*) adopted in the N. G. C. is correct, the nebula being 18^s following and 3^m 9^s north of the star *Munich 851*.

In the *Astr. Nachr.*, No. 1520, d'Arrest announced that a small object stated by Schmidt to be 5^s preceding and 6' south of M 49 (*h* 1294) could not be seen by him, and that only two very small stars appeared in the place. As nothing has been seen in the place in question by any other observer, there seems no reason to assume that a nebula ever existed there. W. Herschel's II. 498 cannot have been the same as Schmidt's object, as H. would no doubt have pointed out that it was between II. 18 and M 49; and II. 498 is therefore beyond a doubt = II. 18.

Whatever view we take of the nature of nebulæ, the question whether these objects vary in brightness must be considered as one of paramount importance. It is for this reason that I have thought it desirable to call attention to Mr. Swift's nebula; but it is with some reluctance that I have done so, as the greatest possible caution is necessary in deciding whether any change has really taken place in objects of this class. The lessons taught us by the satellite of *Venus* and the intra-mercurial planets ought to be kept well in mind when we feel inclined to draw important conclusions from very uncertain observations, which may admit of a different interpretation.

Note on the Variability of Es-Birm 673 = D.M. + 39° 4208.
By the Rev. T. E. Espin, B.A.

This star is No. 118 of my list of "Some New Red and Orange-red Stars," *Monthly Notices*, xlvi. No. 5, p. 293. The brightness on the night of its discovery (1885 July 9) was 7.9, and it irregularly diminished to 9.0. Since this time it has been occasionally observed, and found to be practically invariable up to the present year. On comparing some of Dr. Wolf's photographs together I was struck by the differences in the magnitudes of this star. The colour is fine red, and consequently

* C. H. has "lbM," an important difference.

† C. H. has March 23.